System Architect

FSA-EAF

Data

Information Dictionary

Many of the architectural products have a graphical representation. However, there is textual information in the form of definitions and metadata (i.e., data about an item) associated with these graphical representations. The Information Dictionary (also know as the System Architect Repository) provides a central source for all definitions and metadata, including those that may be provided for convenience within another product as well. At a minimum, the Information Dictionary is a glossary with definitions of terms used in the given architecture description. The Information Dictionary consists of the attribute table information for all the other work products. The Information Dictionary makes the set of architecture products stand-alone so that it may be read and understood without reference to other documents.

Each labeled graphical item (e.g., icon, box, or connecting line) in the graphical representation of an architectural product will have a corresponding entry in the Information Dictionary. The type of metadata included in the Information Dictionary for each type of item depends on the type of architectural product from which the item is taken.

☞   *In System Architect, the encyclopedia serves as an integrated dictionary. To get certain items or presentation of dictionary items from the encyclopedia requires building reports from the encyclopedia. Since the amount of data in a complete Architecture can be quite large and the purpose or audience of any given presentation or utilization of the integrated information can vary widely there are no special reports included in System Architect for generating Integrated Dictionary reports. Construction of user-defined reports will be covered at the end of the material.*

Data Modeling

Overview

Data Models are used to document the data requirements and structural business process rules of the architecture's Data Focus. They describe the data and information that is associated with the information exchanges of the architecture, within the scope and to the level of detail required for the purposes of the architecture. Included are information items and/or data elements, their attributes or characteristics, and their interrelationships.

The purpose of a given architecture helps to determine the level of detail needed in this view. A formal "data" model that is detailed down to the level of data, their attributes, and their relationships is required for some purposes, such as when validation of completeness and consistency is required. However, for other purposes, a higher-level, information-focused data model of the domain of interest will suffice (such as a Conceptual Information Model, showing relationships between Data Classes). The term "data model" is used here in this context, regardless of the level of detail the model exhibits. The Data Focus of the framework is currently divided into two components;

- **Planner Perspective**: Data Areas and Data Classes

- **Owner Perspective**: Conceptual Information Model

Other levels of abstraction are outside the scope of the current Enterprise Architecture initiative at FSA.

Whatever the purpose of the architecture and the level of detail it exhibits, a Data Model can help discover and document operational information requirements and "business rules.

Framework Support

System Architect provides a GUI interface for users to access a select grouping of diagrams and definitions. In the Data Column, users will be shown one popup browser window when they click on the Scope cell and two when the click on the Enterprise Model cell.

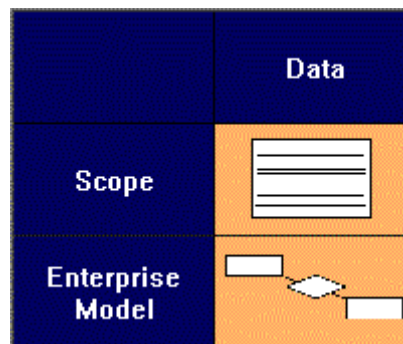✍   Navigate to the Framework Browser and explore the Data Focus of the FSA-EAF Framework.

Figure 1 – Data Focus of the FSA-EAF Framework
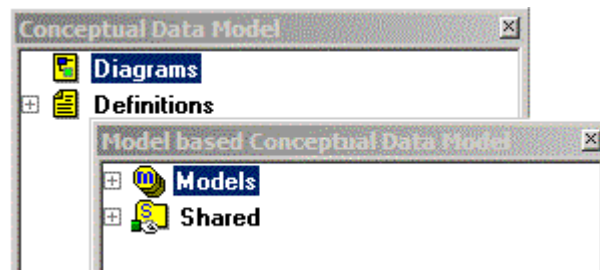

Figure 2 – Data Focus Browsers

☞   *Note that although diagrams can be created with both browsers, it is good practice when in the Enterprise Model perspective to always create Conceptual Information Model from the browser that contains the **'Models'** identifier.*

Data Area

When data modeling in System Architect users will be utilizing the same basic data modeling techniques in each cell of the framework. What separates the perspectives in the FSA-EAF framework will be how users instantiate their Data Area definitions. For instance, the user may develop both conceptual and logical Data Area definitions, however, they may only choose to model **Data Classes** while in the realm of a conceptual perspective. When the user begins the transition into the logical level of abstraction they will get definition reuse from the conceptual PDM, but may choose to develop Entity Relation diagrams and fully define Entities at a lower level of detail. This is done without changing the original definition created in the conceptual view.

A textual description of up to 2000 characters can be used to describe the Data Area. A Data Area

represents a summary of the information/data that supports a major FSA business function. The definition can be accessed directly through the Browser or from references to it in a number of matrices. Data Area definitions define the scope of Conceptual Information Models and their child Entity Relation diagrams.

✋   Ensure the FSA Enterprise Architecture framework is active. If not access the **File** menu and click **Show Framework**.

Adding and Listing Data Areas

✋   Click on the cell at the **Scope / Data** intersection and ensure the browser named **List of Data Areas and Data Classes** is in focus.

Click the plus (+) sign next to the **Definitions** label and again next to the **Data Area** label.

So far we have instantiated one Data Area.

✋   Add three more Data Area definitions named **Common Customer Care**, **Aid Application** and **Common Servicing for Borrowers**.
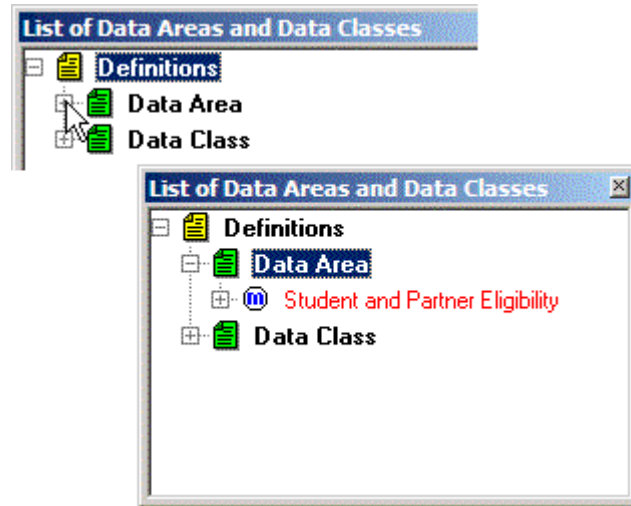

Figure 3 Expanding the List of Data Areas

☞   *The ⓜ notation next to the name of the Data Area signifies that these are "model" definitions. This means that they uniquely identify a collective of related Conceptual Information Models.*

Data Class

In terms of business relationships a Data Class may be thought of as a template, or blueprint, for all entities of that type, at a lower level of abstraction. A data class is a data grouping that supports one or more FSA business processes. They define FSA's information environment at a level of granularity to support the analysis of the business to data, and application to data, relationships and to render these analyses meaningful.

✋   Navigate to the **Scope / Data** cell and list the Data Class definitions instantiated earlier in the course.

☞   *If you can't see the Data Class definitions, open the Conceptual Information Model and double click the relevant symbol to instantiate the definition.*

✋   Double-click each Data Class definition and add the following descriptions:

    FFEL LOAN   Federal Stafford, Plus or Consolidation Loans that are long-term loans insured by state or private nonprofit guaranty agencies and are reimbursed by the federal government for all or part of the insurance claims paid to lenders. This guarantee replaces the collateral or security usually required with long-term consumer loans.

SCHOOL	An organization whose purpose is to deliver post-secondary education to students and financial aid to students where applicable; an institution of higher education that has applied to participate in a Department of Education Title IV financial aid program.
COLLECTION AGENCY	A private company that has contracted with FSA to aid in the collection of defaulted financial aid repayments. This contains basic contact and address information about a collection agency.
LENDER	A private institution that provides loans to borrowers on behalf of an aid recipient who is enrolled at a Department of Education accredited institution of higher education. This may include credit unions, commercial banks, savings and loan associations, eligible schools, insurance companies, a single agency of the state, or pension funds.

Conceptual Information Model

A Data Class definition in the FSA Enterprise Architecture may be represented graphically on the Conceptual Information Model, depicting the relationships between Data Classes, within the bounds of a Data Area.   Each Data Class on the diagram may then define the scope for a child Entity Relation diagram, again within the bounds of the same Data Area.

✋   Expand the **Models** and **Diagrams** labels in the browser at the **Enterprise Model / Data** intersection and open the Conceptual Information Model named **FFEL Loan**.

Note the name of the Data Area this diagram is part of, shown in <brackets> at the end of the diagram name.
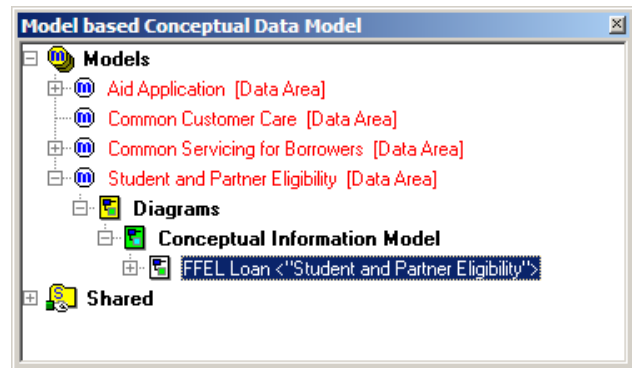

Figure 4 Opening a Model Based diagram

You may view the definition of a symbol by double-clicking the symbol or by right-clicking and selecting Edit.

✋   View the definitions for the Data Class symbols on the diagram. Note the descriptions added directly via the popup browser.

☞   *Definitions may be edited independently of the diagram they are represented on.*

✋   Modify the diagram to show that a **GUARANTEE AGENCY guarantees** a **FFEL LOAN** and is described as follows: **Public or private agency that acts as the primary insurer under the Federal Family Education Loan (FFEL) Program. Guaranty Agencies may be state-owned or private, non-profit institutions. They have a broad authority to establish policies and procedures for administering the FFEL programs in accordance with the enabling status and regulations.**

Architectural Relationships

The Data Area and Data Class definitions are related to artifacts in the Business Function and People columns of the FSA framework. All of these relationships can be managed through a number of matrices, accessible through the popup window that is displayed when clicking on either cell in the Data column.
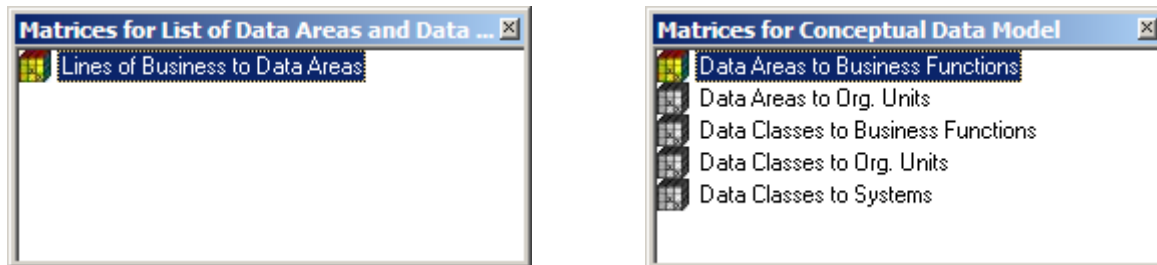

Figure 5 Data Matrices

✋   Open the Data Area definition Student & Partner Eligibility and view the Business Relationships tab.
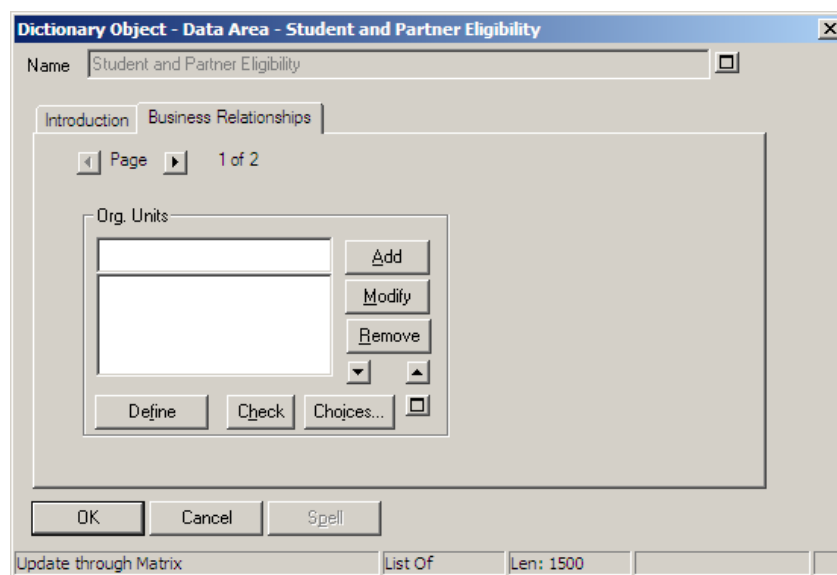

Figure 6 Data Area definition

☞   *Additional properties may appear on more pages of a definition.*

✋   Navigate back to the **Scope / Data** cell. If the matrix browser is not active click on the cell.

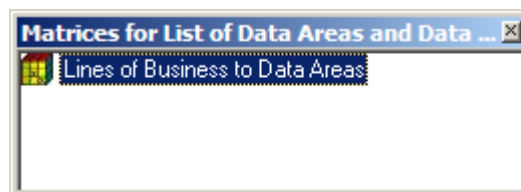✋   Double-click the matrix named **Lines of Business to Data Areas.**

Figure 7 Matrix at Scope / Data

When a matrix is launched you are given the opportunity to filter the contents of the matrix axis by property values.

If you choose to set filters you may then Save the 'structure' of that matrix.

✋ Click **Next >** to advance the matrix setup.

Figure 8 Matrix Filter

The next screen that appears is the pick list of definitions for the rows and columns of the matrix.

If filters have not been set for a row or column definition type, all instances of those definitions will be available in the pick list.

You may also select and deselect definitions within the bounds of a filter. Again you may save your settings.

The matrix editor allows the user to enter new definitions of both the row and column types.

✋ Click **Finish** so that we may enter some Lines of Business and relate those to the Data Area definitions.

Figure 9 Matrix Pick List

The SA Matrix Editor

System Architect provides a suite of Matrix Editors that can be used to enter information on the models before a single diagram is drawn. From an analysis standpoint, entering data through matrices provides the user with a wide view of the problem domain and the information that the models can/will contain, and the intersections of dependant definitions.

Matrix Editors provide a different entry point for entering information into the project encyclopedia, in addition to the normal techniques of using diagrams and definitions. Information entered into the Matrix Editors is automatically entered into symbol definitions; changes to information in either place are synchronized – the Matrix Editors simply provide another view of the information.

The Matrix Editors are synchronized with definitions in System Architect. This means that changes made to definitions in the matrix are automatically visible via the framework browsers and vice versa. Such changes may be the addition of new definitions or the modification of existing definitions.

To add a new definition instance to either a Row or Column right-click in the grey row or column area that displays the names of definitions.

In the case of a new column select Add Column Definition or click the [ ] button in the toolbar.

To add a new row select **Add Row Definition**, as shown or click the [ ] button in the toolbar.

The floating popup menu also gives the user the opportunity to remove or modify a row or column definition. When Modify Row (or Column) Definition is selected the definition window will open allowing access to its properties.

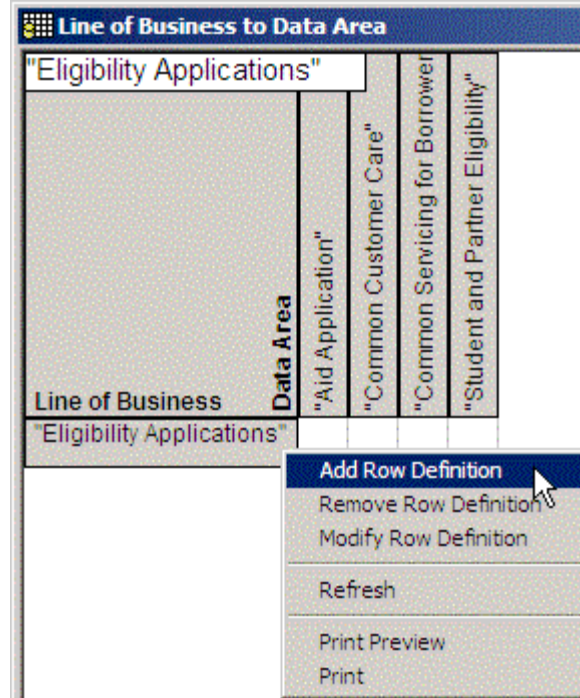To relate a column definition to a row definition you may simply click in the intersecting cell of the matrix.

Figure 10 Adding a definition in the Matrix Editor

✍   Relate the Line of Business definition, **Eligibility Applications** to the Data Area **Student & Partner Eligibility**, as shown in Figure 10.

To close a matrix click the [X] close button at the top right of the matrix window or select **Exit** under the **Matrix** menu.

You may then Save the current matrix layout. This does not pertain to the contents of matrix or their relationships (these have been saved back to the encyclopedia dynamically) but rather the format of the matrix.

For instance it is possible to slant the column definition names, as shown. This is achieved by right-clicking on the column name area and under Orientation, selecting Slanted, Vertical or Horizontal.

Figure 11 Line of Business to Data Area Matrix

Matrix Exercises

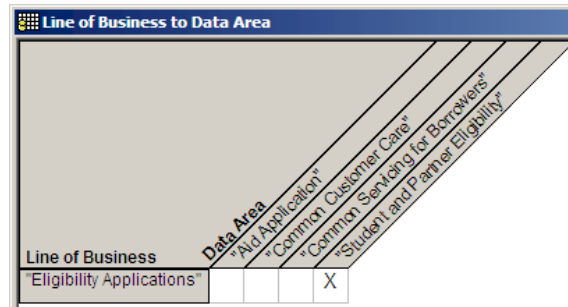The following matrices are all accessible at the **Enterprise Model / Data** cell of the FSA framework.

✍ Populate each of the matrices; this may include the creation of new definition types for either the rows or the columns of each matrix.

Data Areas to Business Functions

Core Business Function	Data Area	"Student and Partner Eligibility"	"Common Customer Care"	"Aid Application"	"Common Servicing for Borrowers"
"Eligibility Processing"		X			
"Monitoring and Oversight"		X			
"Output Processing"		X			
"Performance Monitoring"		X			
"Taking Actions"		X			
Application		X			
Compliance		X			X
"Entitlement Processing"					X
"Early Collections"					X
"Late Collections"					X
"Receivables Billing"					X
"Payment Processing"					X
"Account Maintenance"					X

Data Areas to Org. Units

Organizational Unit	Data Area	"Aid Application"	"Common Customer Care"	"Common Servicing for Borrowers"	"Student and Partner Eligibility"
"Customer Service and Support Call Center"		X	X		

Data Classes to Business Functions

Core Business Function	Data Class	PERSON	SCHOOL	"AID AWARD"	"COLLECTION AGENCY"	"DIRECT LOAN"	"DL PAYMENT"	"PARTNER PAYMENT"	"FFEL LOAN"	"GL ACCOUNT"	"GUARANTEE AGENCY"	"HEAL LOAN"	"PERKINS LOAN"	"PARTNER INVOICE"
"Account Maintenance"		X	X					X						X
"Early Collections"				X										
"Eligibility Processing"														
"Entitlement Processing"								X						
"Late Collections"				X										
"Monitoring and Oversight"											X			
"Output Processing"														
"Payment Processing"				X		X					X			
"Performance Monitoring"														
"Receivables Billing"				X										
"Taking Actions"														
Application				X		X			X			X	X	
Compliance											X			

Data Classes to Org. Units

Organizational Unit	Data Class	SERVICER	"AID AWARD"	APPLICATION	"COLLECTION AGENCY"	"DIRECT LOAN"
"Customer Service and Support Call Center"		X				

Data Classes to Systems

Data Class to Business System

Business System	"AID AWARD"	"COLLECTION AGENCY"	"DIRECT LOAN"	"DL PAYMENT"	"ENROLLMENT INFO"	"FFEL LOAN"	"GL ACCOUNT"	"GUARANTEE AGENCY"	"HEAL LOAN"	"LOAN CONSOLIDATION REQUEST"	"PARTNER INVOICE"	"PARTNER PAYMENT"	"PELL GRANT"	"PERKINS LOAN"	"Promissory Note (P-NOTE)"	"SCHOOL FUNDING"	"SYSTEM USER INFO"	"WORK STUDY"	FAFSA	FISAP	FSEOG	FUND	LENDER	PERSON	SCHOOL	SERVICER	PIN
"Financial Management Systems"							X	X		X	X	X				X	X			X		X	X		X	X	
"Accounts Receivable"																											
"Common Origination and Disbursement (COD)"	X			X								X	X	X		X	X	X				X			X	X	
"Central Processing System"																											
"Common Servicing for Borrowers"		X	X	X	X	X			X	X				X	X	X						X			X	X	
"CFO Data Mart"																											

✍ When you have completed the matrices return to the framework and view the pages of a selection of Data Area and Data Class definitions. Note the properties that now contain references to other architectural artifacts across the framework.